

INSTRUCTOR CONTACT INFORMATION

Instructor: Dr. Justin Esarey

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Office Hours: Monday and Tuesday, 2:00p-3:00p

COURSE OBJECTIVES AND LEARNING OUTCOMES

This course introduces students to the basic philosophical problems of applied social science, techniques for achieving accurate causal and explanatory inference, and practical skills for executing a successful research project.

Students will be able to:

1. Understand the scientific method as it applies to social science, including scholarly controversies and potential shortcomings, with a particular emphasis on hypothetico-deductivism and falsificationism.
2. Understand different viewpoints on the use and interpretation of empirical research in political science, including the relationship between theory and empirical research.
3. Understand and critique the Neyman-Rubin and Pearl structural causal modeling frameworks.
4. Understand the strengths and weaknesses of various forms of research designs for empirical social scientific research.
5. Communicate their understanding of these topics by using LaTeX to create written reports and slide presentations.
6. Communicate their understanding of these topics by giving an instructional and informative presentation of research.

REQUIRED TEXTS AND MATERIALS

All course assignments must be typed in LaTeX, but free software exists to make this easy to accomplish. I suggest using LyX (<http://www.lyx.org/>) in combination with MiKTeX on Windows (<http://miktex.org/>), MacTeX on Macintosh (<http://www.tug.org/mactex/>) or TeXLive on Linux (<http://www.tug.org/texlive/>).

All students must have a valid Rice e-mail address and login (and access to the OWL-space website) to participate in this course.

Textbooks:

1. Balashov, Yuri and Alex Rosenberg, eds. *Philosophy of Science: Contemporary Readings*. 2002. Routledge: Oxford.
2. Clarke, Kevin and David M. Primo. 2012. *A Model Discipline: Political Science and the Logic of Representations*. Oxford University Press: Oxford.
3. Dunning, Thad. 2012. *Natural Experiments in the Social Sciences: A Design-Based Approach*. Cambridge University Press: Cambridge.
4. Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton.
5. Morgan, Stephen L. and Christopher Winship. 2007. *Counterfactuals and Causal Inference: Methods and Principles for Social Research, Second Edition*. Cambridge University Press: Cambridge.
6. Pearl, Judea. 2000. *Causality: Models, Reasoning, and Inference*. Cambridge University Press: Cambridge.
7. Shadish, William R., Thomas D. Cook, and Donald T. Campbell. 2002. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton-Mifflin: Boston.

GRADED ASSIGNMENTS

Grade Components: A student's grade will be assessed in three ways:

- Reaction papers: 50% of the grade
- Class participation: 25% of the grade
- Presentations: 25% of the grade

Reaction Papers: Each week, students must submit a 500 word (maximum) summary of the week's topic that addresses:

1. What the key insights from the week's readings are,
2. Why the topic is important for political scientists to think about, and
3. How the topic bears on the student's own research interests.

4. The reaction paper must conclude with **at least three discussion questions** pertaining to the week's reading. The discussion questions should not be vague, and should be designed to generate an interesting and informative discussion in class.

Students leading discussion during a given week need not submit a reaction paper for that week.

Class Participation: Students will be randomly called upon by the instructor to answer discussion questions pertaining to the week's readings. The quality of the answers, and other contributions to class discussion, will be assessed as a component of the student's grade.

Applied Presentations: For each of the last seven weeks of class, a student will be designated to present an applied paper pertaining to the technique being described that week. At the beginning of class, this student will give a 15-20 minute audiovisual presentation about the paper and how it uses that week's technique. The student will then be responsible for leading the class discussion for that week. (Note: if there are fewer students than weeks, no student will present during some weeks).

GRADE POLICIES

Grading Scale:

100%-97%: A+	86.9%-83%: B	69.9%-67%: D+
96.9%-93%: A	82.9%-80%: B-	66.9%-63%: D
92.9%-90%: A-	79.9%-77%: C+	62.9%-60%: D-
89.9%-87%: B+	76.9%-73%: C	>59.5%: F
	72.9%-70%: C-	

Late Work: Assignments are due at the date and time I specify for the assignment. Late assignments will be marked off at 5 percentage points for the first 12 hours late, and an additional 10 percentage points for every subsequent 12 hours late.

ABSENCE POLICIES

Attendance is mandatory in this class, and as graduate students I expect that attendance will not be a problem for you. Every class you fail to attend (without an acceptable excuse—see below) will result in a 2.5 percentage point deduction from your final grade. (I expect that this will never happen.)

Attendance penalties may be waived in the event of death in the immediate family (parent, spouse, sibling, or child) within 2 weeks before the due date, in the event of an unforeseeable medical emergency affecting yourself, your spouse, or your child, or if you are participating in a pre-approved academic activity (e.g., a conference). Penalty waivers are at the discretion of the instructor. I may require supporting documentation.

RICE HONOR CODE

All forms of academic misconduct will be handled according to the Rice University Honor Code. Details on the Honor Code are available at <http://honor.rice.edu/honor-system-handbook/>.

If you ever have any questions about what you should do to stay within the honor code on a particular assignment, PLEASE contact me with your question and I can assist you. I cannot guarantee a timely response unless you contact me at least 24 hours in advance of the time the assignment is due.

DISABILITY SUPPORT SERVICES

If you have a disability and require accommodation in this class, please contact me as soon as possible (within the first two weeks of class) to discuss these accommodations. You will also need to contact the Disability Support Services Office (telephone extension: 5841) in the Allen Center.

SYLLABUS CHANGE POLICY

The policies of this syllabus (other than absence policies) may be changed by Prof. Esarey with advance notice.

COURSE OUTLINE AND READING ASSIGNMENTS

8/24: How to use LaTeX

1. Download and install:
 - a. MiKTeX (for PC: <http://miktex.org/>) or MacTeX (for OS X: <https://tug.org/mactex/>)
 - b. LyX: <http://www.lyx.org/Download>
2. Read:
 - a. Indian TeX Users Group Tutorial on LaTeX. URL: <http://www.tug.org/tutorials/tugindia/>
3. Bring your laptop to class.

8/31: Experimentation—the heart of science

1. Feynman, Richard. Introduction to Chapter 1, “Atoms in Motion.” Available on-line at <http://goo.gl/aIEACg>.
2. Shadish, William R., Thomas D. Cook, and Donald T. Campbell. 2002. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton-Mifflin: Boston.
 - a. Chapter 1, pp. 1-32: “Experiments and Generalized Causal Inference.”
 - b. Chapter 2, pp. 33-63: “Statistical Conclusion Validity and Internal Validity.”
 - c. Chapter 3, pp. 64-102: “Construct Validity and External Validity.”
3. “Google Consumer Surveys: How it Works.” Available on-line at <http://goo.gl/YT9RYY>.

9/7: Labor Day (no class)

9/14: Designing, implementing, and analyzing a laboratory or survey experiment

1. Gerber, Alan S., and Donald Green. 2012. *Field Experiments: Design, Analysis, and Interpretation*. New York: W.W. Norton & Co.
 - a. Chapters 1-8.

9/21: The hypothetico-deductive method, falsificationism, positivism—and reactions

1. Friedman, Milton. 1953. “The Methodology of Positive Economics.” In Friedman, *Essays in Positive Economics*. Chicago University Press: Chicago, IL. pp 3-46.
2. Balashov, Yuri and Alex Rosenberg, eds. *Philosophy of Science: Contemporary Readings*. 2002. Routledge: Oxford.
 - a. Chapter 3, pp. 45-55: “Two Models of Scientific Explanation” by Carl Hempel.
 - b. Chapter 17, pp. 294-301: “Science: Conjectures and Refutations” by Karl Popper.
 - c. Chapter 22, pp. 340-361: “Two Dogmas of Empiricism” by W.V.O. Quine.
 - d. Chapter 25, pp. 410-420: “The Structure of Scientific Revolutions” by Dudley Shapere.
 - e. Chapter 26, pp. 421-437: “Objectivity, Value Judgment, and Theory Choice” by Thomas Kuhn.

9/28: The link between theory and empirical work in political science

1. Clarke, Kevin and David M. Primo. 2012. *A Model Discipline: Political Science and the Logic of Representations*. Oxford University Press: Oxford. 220 pp.

10/5: Explanation and prediction as goals of empirical work

1. Breiman, Leo. 2001. “Statistical Modeling: The Two Cultures.” *Statistical Science* 16(3): 199-231.
2. Shmueli, Galit. 2010. “To Explain or to Predict?” *Statistical Science* 25(3): 289-310.
3. Stevens, Jacqueline. 2012. “Political Scientists are Lousy Forecasters.” *New York Times*, Sunday June 26th, 2012. URL: <http://goo.gl/liq03L>.
4. Dickinson, Matthew. 2012. “No, Political Scientists are NOT Lousy Forecasters – In fact, they are Pretty Good.” *Presidential Power: A Nonpartisan Analysis of Presidential Politics*, June 26th, 2012. URL: <http://goo.gl/8O8j3N>.
5. Henry Farrell. June 24, 2012. “Why the Stevens Op-Ed is Wrong.” *The Monkey Cage*. URL: <http://themonkeycage.org/blog/2012/06/24/why-the-stevens-op-ed-is-wrong/>.

10/12: Midterm recess (no class)

10/19: Causality and inference: The Neyman-Rubin model

1. Morgan, Stephen L. and Christopher Winship. 2007. *Counterfactuals and Causal Inference: Methods and Principles for Social Research, Second Edition*. Cambridge University Press: Cambridge.
 - a. Chapter 1, pp. 3-34: "Introduction."
 - b. Chapter 2, pp. 37-76: "The Counterfactual Model."
2. Sekhon, Jasjeet S. 2008. "The Neyman-Rubin Model of Causal Inference and Estimation via Matching Methods." Chapter 11 in Box-Steffensmeier et al., eds., *The Oxford Handbook of Political Methodology*. Oxford University Press: Oxford. pp. 271-299.
3. Applied reading: Arceneaux, Kevin, Alan S. Gerber, and Donald P. Green. 2006. "Comparing Experimental and Matching Methods Using a Large-Scale Voter Mobilization Experiment." *Political Analysis* 14: 37-62.

10/26: Causality and inference: the Pearl structural model

1. Pearl, Judea. 2000. *Causality: Models, Reasoning, and Inference*. Cambridge University Press: Cambridge.
 - a. Chapter 1, pp. 1-40: "Introduction to Probabilities, Graphs, and Causal Models."
 - b. Chapter 2, pp. 41-64: "A Theory of Inferred Causation."
 - c. Chapter 3, pp. 65-106: "Causal Diagrams and the Identification of Causal Effects."
 - d. Chapter 4, pp. 107-132: "Actions, Plans, and Direct Effects."
 - e. Chapter 5, pp. 133-172: "Causality and Structural Models in Social Science and Economics."
2. Applied reading: Druckman, James N., and Thomas J. Leeper. 2012. "Learning More from Political Communication Experiments: Pretreatment and its Effects." *American Journal of Political Science* 56(4): 875-896.

11/2: Robustness and replicability in published research

1. Ioannidis, John. 2005. "Why most published research findings are false." *PLoS Medicine* 2(8): 696-701.
2. Ioannidis, John. 2008. "Why most discovered true associations are inflated." *Epidemiology* 19: 640-648.
3. Simmons, Joseph P., Leif D. Nelson, and Uri Simonsohn. 2011. "False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant." *Psychological Science* 22(11): 1359-66.
URL: <http://www.ncbi.nlm.nih.gov/pubmed/22006061>.
4. Elman, Colin, and Arthur Lupia. 2014. "Data Access and Research Transparency (DA-RT): A Joint Statement by Political Science Journal Editors." URL: <http://goo.gl/SuhQuA>.
5. Isaac, Jeffrey C. "For a More Public Political Science." *Perspectives on Politics* 13(2): 269-283.
6. Applied reading: Gerber, Alan, and Neil Malhotra. 2008. "Do Statistical Reporting Standards Affect What is Published? Publication Bias in Two Leading Political Science Journals." *Quarterly Journal of Political Science* 3(3): 313-326.

11/9: Barriers to inference in (observational) research: selection bias, inefficiency, omitted variable bias, and endogeneity

1. King, Gary, Robert O. Keohane, and Sidney Verba. 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton University Press: Princeton, NJ.
 - a. Chapter 4, pp. 115-149: "Determining What to Observe."
 - b. Chapter 5, pp. 150-207: "Understanding What to Avoid."
2. Clarke, Kevin. 2005. "The Phantom Menace: Omitted Variable Bias in Econometric Research." *Conflict Management and Peace Science* 22: 341-352.
3. Geddes, Barbara. 1990. "How the Cases You Choose Affect the Answers the Answers You Get: Selection Bias in Comparative Politics." *Political Analysis* 2: 131-150.
4. Applied reading: von Stein, Jana. 2005. "Do Treaties Constrain or Screen? Selection Bias and Treaty Compliance." *American Political Science Review* 99(4): 611-622.

11/16: Observational research designs: natural experiments

1. Dunning, Thad. 2012. *Natural Experiments in the Social Sciences: A Design-Based Approach*. Cambridge University Press: Cambridge.
 - a. Chapter 1, pp. 1-38: "Introduction: Why Natural Experiments?"
 - b. Chapter 2, pp. 41-62: "Standard Natural Experiments"
 - c. Chapter 8, pp. 235-255: "How plausible is as-if random?"
 - d. Chapter 9, pp. 256-288: "How credible is the model?"
 - e. Chapter 10, pp. 289-310: "How relevant is the intervention?"
2. Applied reading: Gerber, Alan S., Gregory A. Huber, and Seth J. Hill. 2013. "Identifying the Effect of All-Mail Elections on Turnout: Staggered Reform in the Evergreen State." *Political Science Research and Methods* 1(1): 91-116.

11/23 Observational research designs: regression discontinuity designs and instrumental variables

1. Dunning, Thad. 2012. *Natural Experiments in the Social Sciences: A Design-Based Approach*. Cambridge University Press: Cambridge.
 - a. Chapter 3, pp. 63-86: "Regression-discontinuity designs."
 - b. Chapter 4, pp. 87-102: "Instrumental-variables designs."
2. Angrist, Joshua D. and Alan B. Krueger. 2001. "Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments." *The Journal of Economic Perspectives* 15(4): 69-85.
3. Lee, David S., and Thomas Lemieux. 2010. "Regression Discontinuity Designs in Economics." *Journal of Economic Literature* 48(2): 281-355.
4. Applied reading: Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *The American Economic Review* 91(5): 1369-1401. URL: <http://goo.gl/57CUYJ>.

11/30: Observational research designs: panel and cross-sectional data sets

1. Leamer, Edward E. 1983. "Let's take the Con out of Econometrics." *American Economic Review* 73(1): 31-43.
2. Ashenfelter, Orley, and David Card. 1999. *Handbook of Labor Economics*, Volume 2, Part A. North-Holland.
 - a. Chapter 23, pp. 1277-1366: "Empirical Strategies in Labor Economics" by Joshua D. Angrist and Alan B. Krueger.
3. Angrist, Joshua D. and Jorn-Steffen Pischke. 2010. "The Credibility Revolution in Empirical Economics: How Better Research Design is Taking the Con out of Econometrics." *Journal of Economic Perspectives* 24(2): 3-30.
4. Applied reading: Holbein, John B. and D. Sunshine Hillygus. 2015. "Making Young Voters: The Impact of Preregistration on Youth Turnout." *American Journal of Political Science* forthcoming. URL: <http://goo.gl/oWTkFH>.